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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,081	03/18/2005	Khaliq Ahmed	0446-0171PUS1	4223
2292 7590 11/16/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER HANDAL, KAITLY V	
			ART UNIT 1797	PAPER NUMBER
			NOTIFICATION DATE 11/16/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/510,081	AHMED, KHALIQ	
	Examiner	Art Unit	
	Kaity Handal	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16, 18-27, 29 and 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16, 18-27, 29 and 30 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 25 is objected to because of the following informalities: Claim 25 depends on cancelled claim 17. Appropriate correction is required. For prosecution purposes, claim 25 has been rejected as being dependent on claim 16.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 16, 18-19 and 24-27 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buswell et al. (USP 5,360,679) in view of Lesieur et al. (US 6,726,836 B1).

Regarding claims 16, 18-19 and 24-26, Buswell et al. discloses a system for the method of generating hydrogen for use in a fuel cell system, comprising the steps of:

- mixing a hydrogen-containing stream (11) with a primary fuel (0) and delivered to a hydrogenation catalyst (158) where organic sulfur-containing compounds in the primary fuel (0) are converted to H₂S and/or non-sulfur-containing hydrocarbons; wherein the hydrogen-containing stream (11) is used for hydrodesulfurisation (158) of a primary hydrocarbon fuel (0) supplied to the fuel cell system.

Buswell teaches wherein hydrogen-containing stream (11) generated from fuel stream (4) is recycled. Buswell fails to teach processing a fuel (4) which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream (6, 11) wherein the fuel stream (4) is processed without having been subjected to hydrodesulfurization. Lesieur teaches a desulfurizing process wherein the hydrogen source can be derived from a processed fuel stream without having been subjected to hydrodesulfurization step, for example the hydrogen can be derived from a hydride bed; or from an electrolysis bed or from some other source (col. 5, lines 61-64) which could include reforming processes. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the hydrogen (11) recycled stream in Buswell's process with the hydrogen stream of Lesieur which can be derived from a hydride bed; or from an electrolysis bed or from some other source (which could include reforming processes) as an obvious alternative absent any critical results.

Regarding claims 18-19, while Buswell et al. does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

- Regarding claim 27, Buswell et al. discloses a fuel processor which is used to produce a hydrogen-containing stream (11) and mixing it with a primary fuel (0) wherein

the mixed stream is delivered to a hydrogenation catalyst (158) where organic sulfur-containing compounds in the primary fuel (0) are converted to H₂S and/or non-sulfur-containing hydrocarbons; wherein the hydrogen-containing stream (11) is used for hydrodesulfurisation (158) of a primary hydrocarbon fuel (0) supplied to the fuel cell system.

Buswell teaches wherein hydrogen-containing stream (11) generated from fuel stream (4) is recycled. Buswell fails to teach processing a fuel (4) which is essentially free of organic sulfur-containing compounds to produce a hydrogen-containing stream (6, 11) wherein the fuel stream (4) is processed without having been subjected to hydrodesulfurization. Lesieur teaches a desulfurizing process wherein the hydrogen source can be derived from a processed fuel stream without having been subjected to hydrodesulfurization step, for example the hydrogen can be derived from a hydride bed; or from an electrolysis bed or from some other source (col. 5, lines 61-64) which could include reforming processes. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the hydrogen (11) recycled stream of Buswell with the hydrogen stream of Lesieur which can be derived from a hydride bed; or from an electrolysis bed or from some other source (which could include reforming processes) as an obvious alternative absent any critical results.

Regarding claims 29-30, while Buswell et al. does not explicitly disclose said hydrogen-containing stream being used in the fuel cell system during start-up and shut-down of the system, since the reference is silent to any provision for operation of the fuel cell system other than using of said hydrogen-containing stream, said hydrogen-

containing stream would be, inherently, used during entire operation cycle of said fuel cell system, including during start-up and shut-down of said fuel cell system.

Regarding limitations recited in claims 27 and 29-30 which are directed to a manner of operating disclosed system, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

4. Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buswell et al. (USP 5,360,679) in view of Lesieur et al. (US 6,726,836 B1) as applied to claim 16.

Regarding claims 20-22 Buswell et al. as modified discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose to what degree the fuel is desulfurized. As the instant application is silent to unexpected results, it would have been an obvious choice for an ordinary artisan at the time of the invention to perform said desulfurization process until the amount of sulfur in the fuel falls below a predetermined level, for example at most 1 ppm by volume sulfur or at most 0.1 ppm by volume sulfur even entirely free of sulfur, in order to maximize efficiency of the reformer operation by balancing the cost of sulfur removal with the cost inefficient operation

caused by sulfur poisoning of downstream catalyst and eventually with the cost of said catalyst replacement. See *In re Sovish*, 769 F.2d 738, 742-43, 226 USPQ 771, 774 (Fed. Cir. 1985); and *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buswell et al. (USP 5,360,679) in view of Lesieur et al. (US 6,726,836 B1), as applied to claim 16, and further in view of Jeschke (DE 100 19 548 A1).

Regarding claim 23 Buswell et al. as modified discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the process wherein the fuel which is processed is selected from bioethanol, biodiesel, rapeseed oil, rapeseed methyl ester, canola oil, canola methyl ester, corn oil, hemp oil, switch grass oil, fatty acid methyl esters, linseed oil, linseed methyl ester, sunflower oil, sunflower oil methyl ester, soy bean oil, palmitic acid, lauric acid, stearic acid, lanoleic acid and mixtures of any two or more of these.

Jeschke teaches that fuels selected from bioethanol, biodiesel, rapeseed oil, rapeseed methyl ester, canola oil, canola methyl ester, corn oil, hemp oil, switch grass oil, fatty acid methyl esters, linseed oil, linseed methyl ester, sunflower oil, sunflower oil methyl ester, soy bean oil, palmitic acid, lauric acid, stearic acid, lanoleic acid and mixtures of any two or more of these can be successfully used in reforming processes to provide hydrogen for fuel cells ([0001]-[0012] and claims 3-4). Additionally, it is clear from the Jeschke disclosure that said fuels are free of sulfur and therefore using of said

fuel would eliminate the necessity of sulfur removal from the fuel of modified Buswell et al.

It would have been obvious to one having ordinary skill in the art at the time of the invention to use the fuel of Jeschke, as set forth above, in the modified process of Buswell et al. for the purpose of maximizing efficiency of the reformer operation by balancing the cost of sulfur removal with the cost using fuel of Jeschke. See *In re Sovish*, 769 F.2d 738, 742-43, 226 USPQ 771, 774 (Fed. Cir. 1985); and *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969).

Response to Arguments

Applicant's arguments with respect to claims 16, 18-27, and 29-30 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendment.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not.

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KH

11/9/2007


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